

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND**

UNITED STATES OF AMERICA)	
)	
v.)	CASE NO.: 8:24-CR-211-TDC
)	
HOAU-YAN WANG,)	
)	
Defendant.)	

**DEFENDANT’S RESPONSE TO THE GOVERNMENT’S MOTION TO EXCLUDE
DEFENDANT’S EXPERTS FROM TESTIFYING AT TRIAL**

The Government argues, in essence, that this Court should exclude Dr. Wang’s proffered experts because it does not like their conclusions. It also raises claims that are appropriate for cross-examination at trial but fail to serve as acceptable bases for excluding the experts’ testimony altogether. Dr. Wang is entitled to present a defense, and that includes defending against the testimony and opinions of the Government’s proffered expert, Dr. Paul Brookes. He has done so by providing extremely qualified experts to discuss various aspects of Dr. Brookes’s testimony. Therefore, if this Court denies Dr. Wang’s pending motion to exclude Dr. Brookes’s testimony—thereby allowing Dr. Brookes to testify at trial—the Court should also deny the Government’s motion to exclude Dr. Wang’s experts so that he can present a defense to the Government’s case.

1. The indictment alleges criminal offenses related to Dr. Wang’s work as a research scientist, and the Government plans to call Dr. Brookes to testify about it.

Dr. Wang is a neuroscientist, educated in the field of pharmacology and recently retired from a position as a tenured medical professor of physiology, pharmacology, and neuroscience. (Doc. 1 ¶ 1; Ex. 1 at 1). Beginning nearly two decades ago, Dr. Wang became an “advisor and consultant” for Cassava Sciences, Inc., f/k/a Pain Therapeutics, Inc. (“Cassava”), a publicly traded biopharmaceutical company, whose work focused on the development of an Alzheimer’s drug. (Doc. 1 ¶¶ 2-3; Ex. 1 at 15).

From 2005 to 2023, during his employment at the City University of New York (“CUNY”), Dr. Wang conducted drug research for Cassava using several laboratory techniques, including a protein detection technique called Western blotting, on animal and human postmortem brain tissues and human body fluids. (Doc. 1 ¶ 9). Western blotting is a largely visual laboratory technique that allows a trained scientist to detect a specific protein by developing and analyzing a visible “band” on x-ray film. (*Id.*). Separate from the visual image of a Western blot “band,” the test’s results can be quantified using a process called densitometry, which compares the darkness and thickness of various bands to determine the relative protein amounts in each sample. (*Id.*). The Government’s indictment accuses Dr. Wang of manipulating images of certain of his Western blots connected to his work with Cassava on behalf of CUNY. (*See, e.g., id.* ¶ 14.c (accusing Dr. Wang of “manipulating data and images of Western blots”)).

In light of the scientific foundation underlying the allegations against Dr. Wang, the Government intends to elicit testimony from Dr. Paul Brookes to prove its case. Specifically, the Government intends for Dr. Brookes to opine that Dr. Wang submitted fabricated Western blot images in federal grant proposals. (*See, e.g., Ex. 5 at 5*). Dr. Brookes will attempt to support his opinion using a “3-stage pipeline” process he applied to various images using any one or unknown combination of analytic methods that he alleges are “standard.” (*Ex. 4 at 12-16*). Notably, it appears that the Government is relying heavily on Dr. Brookes’s testimony to support a conviction.

Dr. Wang has moved to exclude Dr. Brookes’s testimony. (Doc. 86.) In his motion, Dr. Wang objects to Dr. Brookes’s testimony as inadmissible under Federal Rule of Evidence 702 for three reasons: (1) Dr. Brookes’s proffered testimony about forensic image comparison is outside of his expertise in biochemistry and research of metabolism in heart attacks; (2) Dr. Brookes’s methods and principles have not been sufficiently proven to be reliable; and (3) Dr. Brookes’s

testimony would usurp the jury's role rather than assist it. Dr. Wang's motion is currently pending before this Court.

2. Responsive expert testimony is therefore necessary for Dr. Wang's defense, and Dr. Wang's proffered experts are qualified to testify.

In the event this Court denies Dr. Wang's request to exclude Dr. Brookes's testimony, testimony from Dr. Ernest P. Chiodo and Alyssa Lisiewski are necessary to defend against the Government's allegations. Both Dr. Chiodo and Ms. Lisiewski are qualified in their respective fields and would assist the jury in determining the weight and credibility of the Government's evidence—*i.e.*, Dr. Brookes's testimony—against Dr. Wang.

a. Dr. Chiodo is qualified to testify under Rule 702.

The Government contends that Dr. Chiodo is not qualified to testify about Western blot experiments or image analysis. (Doc. 85 at 4.) It also argues that Dr. Chiodo's opinions are not sufficiently reliable under Rule 702. (*Id.* at 5-8). Its complaints are meritless.

Federal Rule of Evidence 702 provides that a witness who is qualified as an expert by "knowledge, skill, experience, training, or education" can provide testimony only if (1) the expert's "scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or determine a fact in issue"; (2) "the testimony is based on sufficient facts or data"; (3) "the testimony is the product of reliable principles and methods"; and (4) "the expert's opinion reflects a reliable application of the principles and methods to the facts of the case." Fed. R. Evid. 702. Rule 702 requires trial courts to ensure that an expert's testimony is relevant and reliable. *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 589 (1993). The trial court's inquiry is a flexible one and must be solely focused on principals and methodology rather than the conclusions they produce. *Id.* at 594-95.

First, the Government’s complaint that Dr. Chiodo lacks the knowledge, skill, experience, training, or education regarding Western blot experiments is wholly incorrect. Dr. Brookes—the Government’s own expert—described Western blot experiments as a common, if not “often necessary,” process in biomedical sciences. (Ex. 4 at 1). Dr. Chiodo has a long-established history in biomedical sciences. Indeed, the first page of Dr. Chiodo’s CV lists him as a “Graduate Biomedical Engineer,” and the third page describes his biomedical engineering activities. (Ex. 6 at 1, 3). Additionally, Dr. Chiodo obtained a Master of Science in biomedical engineering from Wayne State University Department of Biomedical Engineering, College of Engineering and School of Medicine. (*Id.* at 2). Dr. Chiodo presented to Wayne State University’s Department of Biological Engineering in 2007 and 2008. (*Id.* at 20, 22). And, in 2019, he was honored by the Wayne State University College of Engineering Hall of Fame as a Distinguished Biomedical Engineer. (*Id.* at 31). What’s more, in his supplemental report, Dr. Chiodo stated he took formal course work in Western blot technology while studying at Wayne State University and at the University of Oxford, and explained that he has worked with Western blots in his lengthy clinical practice and as an Assistant Professor of Internal Medicine, Public Health, and Family Medicine at Wayne State University School of Medicine. (*Id.* at 2). Dr. Chiodo is fully qualified to testify about Western blot experiments.

Second, the Government misses the purpose of Dr. Chiodo’s proffered testimony when it alleges that Dr. Chiodo is unqualified to testify about image analysis. (*See* Doc. 85 at 5-6). The purpose of Dr. Chiodo’s testimony is to challenge the reliability of Dr. Brookes’s methodology within the scientific community. For a process as highly scientific, technical, and recognized as Western blot imaging, whether a method of evaluation has been recognized within the same community is a critical question for the jury to consider. The question before this Court is whether

Dr. Chiodo has sufficient knowledge, skill, experience, training, or education beyond what the average juror possesses that enables him to do testify as an expert. *See United States v. Farrell*, 921 F.3d 116, 144 (4th Cir. 2019) (noting that one factor courts regarding the admission of expert testimony consider is whether the testimony relies on “some specialized knowledge or skill or education that is not in the possession of the jurors”) (quoting *Certain Underwriters at Lloyd’s, London v. Sinkovich*, 232 F.3d 200, 203 (4th Cir. 2000)). In light of Dr. Chiodo’s distinguished career, he clearly has knowledge, skill, experience, training, and education beyond that of an average juror to opine on Dr. Brookes’ and, by extension Dr. Wang’s, methods. Dr. Chiodo has eight science degrees: six Master of Science degrees, a Master of Public Health degree, and a Doctor of Medicine degree, all in addition to his Bachelor of Arts and Juris Doctor degrees. (Ex. 6 at 1-2). Within his various scientific and medical fields, he has practiced medicine, researched, lectured, and published. (*Id.* at 2-3, 8-30). He has taught at universities and joined professional organizations. (*Id.* at 3-4). And he has advised in a variety of director and leadership positions. (*Id.* at 7-8). With that background, to determine whether a method of evaluation has been recognized within the scientific community, Dr. Chiodo searched medical and scientific literature and databases where, as an expert in Western blot experiments, he would expect to find evidence of any scientifically recognized or validated review processes for Western blot imaging. (Ex. 7 at 3-4). He found none. (*Id.*).

Third, the Government generally complains about Dr. Chiodo’s methodology based only on the conclusions he reached. Indeed, at one point it alleges that “Dr. Chiodo’s search was so deficient such that his opinion is unreliable.” (Doc. 85 at 5). However, courts do not measure the admissibility of expert testimony by the conclusions reached by the proffered expert. Instead, courts measure the admissibility by the process by which the proffered expert reached its conclusions.

United States v. Moreland, 437 F.3d 424, 431 (4th Cir. 2006) (“The inquiry to be undertaken by the district court is a ‘flexible one’ focusing on the ‘principles and methodology’ employed by the expert, not on the conclusions reached.”) (citing *Daubert*, 509 U.S. at 594-95); *United States v. Hunt*, 99 F.4th 161, 180 (4th Cir. 2024) (“In performing this gatekeeping function, the district court must focus on the expert’s ‘principles and methodology, not the conclusions they generate.’”) (quoting *In re Lipitor Mktg., Sales Prac. & Prods. Liab. Litig.*, 892 F.3d 624, 631 (4th Cir. 2018)).

The Government argues that this Court should ignore this body of case law and evaluate Dr. Chiodo’s conclusions here because, according to the Government, “[a] simple internet search quickly brings up an article entitled ‘SILA: A System for Scientific Image Analysis,’ published in Nature’s Scientific Reports, a peer-reviewed journal that was the fifth most-cited journal in the world in 2023.” (See Doc. 85 at 5). The Government’s argument fails for two reasons. For one, and most importantly, the Government’s claim is appropriate for cross-examination at trial, not a basis for exclusion. *Bresler v. Wilmington Trust Co.*, 855 F.3d 178, 195 (4th Cir. 2017) (“‘[Q]uestions regarding the factual underpinnings of the expert witness’ opinion affect the weight and credibility’ of the witness’ assessment, ‘not its admissibility.’”) (quoting *Structural Polymer Grp. v. Zoltek Corp.*, 543 F.3d 987, 997 (8th Cir. 2008)). For another, the article cited by the Government is not inconsistent with Dr. Chiodo’s opinion. Indeed, the article addresses a lack of a scientifically recognized or validated review process and actually supports Dr. Chiodo’s opinion:

Despite the invaluable previous efforts of the scientific community, the problem of scientific image integrity verification is still open, growing in worldwide occurrence and relevance, and still needing attention. In particular, the lack of a unified benchmark that allows the principled evaluation of different techniques hinders the advance of the state of the art. Currently, it is not easy for researchers to either compare or reproduce each others’ results. To the best of our knowledge, there is also no large dataset freely available out there containing diverse, well-documented, and confirmed cases of image manipulations, with rich annotations that are precise enough to allow the calculation of objective metrics. We believe this publication takes a fundamental first step in such direction by addressing these aspects.

Moreira, D., Cardenuto, J.P., Shao, R. et al. SILA: a system for scientific image analysis. *Sci Rep* 12, 18306 (2022).¹ And, the article was published in 2022, *after* the Government began its investigation into this case and *after* the bulk of the relevant work done by Dr. Wang was performed, further reducing its potential relevance. (*See* Doc. 1 ¶¶ 10, 15-27, 29, 32, 34, 37, 39).

The Government's argument that Dr. Chiodo did not review all of Dr. Brookes's reports is likewise appropriate for cross-examination rather than a basis for exclusion from trial. *Bresler*, 855 F.3d at 195. Nevertheless, Dr. Chiodo has since reviewed Reports 1-3, and his opinion remains the same. (Ex. 8 at 1). This Court should overrule the Government's attempts to exclude admissible expert testimony because it disagrees with the expert's conclusions.

To the extent the Government challenges Dr. Chiodo's methodology by arguing, "[a]s a threshold matter, it is not clear how someone searching a scientific database for information . . . can constitute expert testimony," it ignores that "Rule 702 testimony need not be arcane or especially difficult to comprehend." *Kopf v. Skyrn*, 993 F.2d 374, 377 (4th Cir. 1993). As long as the witness formed its opinion with specialized knowledge, skill, experience, education, or training, the opinion testimony merely needs to be outside of the jury's common knowledge. *Farrell*, 921 F.3d at 144. Dr. Chiodo's search for a scientifically recognized or validated review process for the biomedical science of Western blotting certainly meets that threshold. The average juror evaluating the same search materials as Dr. Chiodo would not have sufficient knowledge or training to analyze such

¹ Undersigned counsel only relies upon the article's content in this response to highlight why potentially impeachable information gives rise to cross-examination material and is not a basis to exclude relevant testimony. As a result, undersigned counsel does not address each article the Government cited in its motion.

materials.²

Next, the Government's challenge to Dr. Chiodo's opinion concerning NIH standards or federal guidance again attacks Dr. Chiodo's opinion rather than his methodology. (*See* Doc. 85 at 6-7). As noted above, as a medical practitioner and scientific researcher, Dr. Chiodo researched through medical and scientific literature and databases for minimum standards and requirements regarding images submitted in NIH grant applications. (Ex. 7 at 3-4). The Government's assertion that he failed to find relevant material is, again, a topic for cross-examination at trial. *Bresler*, 855 F.3d at 195. It is insufficient to support exclusion of the testimony. *Id.* Notably, the ORI website with publicly-available image analysis tools that the Government identifies to support its argument contains the following notes, among others:

- “Whether a matter involves an unfortunate decision about presentation of the data or an intent to deceive depends upon the context of the image, and the effect of the manipulation upon the interpretation of the results;”
- “The identification of a discrepancy is only the allegation, and it does not by itself demonstrate an intent to falsification of data;” and
- “A discrepancy in the image should not be conflated with a finding of falsification of data or, for that matter, of Research Misconduct. Making those distinctions require additional fact-finding.”

Office of Research Integrity, Samples ORI – The Office of Research Integrity (last accessed August 29, 2025). These notes exemplify why cross-examination is the appropriate venue to challenge Dr. Chiodo's opinions. The Government's disagreement with Dr. Chiodo's opinion does not warrant exclusion of his testimony.

Lastly, the Government argues for the exclusion of Dr. Chiodo's testimony about differential diagnosis. Again, the Government misses the point of the proffered expert testimony.

² Dr. Chiodo's research through scientific literature and databases is no different than lawyers conducting legal research using databases such as Westlaw and LexisNexis.

Dr. Chiodo offers the differential diagnosis opinion by analogy to point out the flaws in Dr. Brookes's methodology here, in that it did not consider all possible alternatives, which is a cornerstone of biomedical analysis. The Government's assertion that Dr. Chiodo's differential diagnosis opinions are not relevant are, again, a topic for cross-examination at trial. *Bresler*, 855 F.3d at 195. (Ex. 7 at 4-5).

For all of the above reasons, the Court should deny the Government's motion in limine to exclude Dr. Chiodo's testimony.

b. Ms. Lisiewski's testimony is highly relevant.

The Government alleges that Ms. Lisiewski's proffered testimony is not relevant under Federal Rules of Evidence 401, 402, and 702. (*See* Doc. 85 at 10-11). Alternatively, it contends that the testimony is inadmissible under Rule 403. (*Id.*). Because Ms. Lisiewski's testimony is relevant to impeach Dr. Brookes's testimony, the Government's motion to exclude her testimony should be overruled.

Only relevant evidence is admissible at trial. Fed. R. Evid. 402. Evidence is relevant if it has any tendency to make a fact of consequence more or less probable. Fed. R. Evid. 401. This is typically a low bar. *United States v. Leftenant*, 341 F.2d 338, 346 (4th Cir. 2003) (citing *United States v. Van Metre*, 150 F.3d 339, 349 (4th Cir. 1998)). "Indeed, to be admissible, evidence need only be 'worth consideration by the jury,' or have a 'plus value.'" *Id.* (quoting *United States v. Queen*, 132 F.3d 991, 998 (4th Cir. 1997)). However, even relevant evidence may be excluded at trial if its "probative value is substantially outweighed by a danger of . . . unfair prejudice, confusing the issues, misleading the jury, undue delay, wasting time, or needlessly presenting cumulative evidence." Fed. R. Evid. 403. To be excluded under Rule 403, the prejudice must be unfair. *United States v. Mohr*, 318 F.3d 613, 619-20 (4th Cir. 2003) (citing 2 Jack B. Weinstein & Margaret A.

Berger, Weinstein's Federal Evidence, § 404.21[3][b] (Joseph M. McLaughlin, ed., 2d ed. 2002)). That is, the evidence must damage an opponent for reasons outside of its probative value. *Id.* at 602. Moreover, the unfair prejudice must “substantially outweigh[] the probative value of the evidence.” *Id.*

Ms. Lisiewski is a certified forensic analyst with extensive experience in digital forensics who performed a forensic metadata analysis using hash values. (Exs. 9, 10). According to Ms. Lisiewski, a hash value is a file's unique digital fingerprint. (Ex. 10 at 5). If a file's content is changed, the hash value will change. (*Id.*). Using metadata analysis of a known and unrelated JPEG/JPG file, Ms. Lisiewski recreated Dr. Wang's general process for preparing images for grant applications, which included adjusting the image's contrast and brightness, framing and cropping specific areas of the image, saving the selected areas as individual files, combining several selected individual files into a PowerPoint slide, and saving the newly-created PowerPoint slide as a new file. (*Id.* at 3-10). Ms. Lisiewski determined that the process of creating the final PowerPoint slide resulted in an inability to hash the individual images within the slide. (*Id.* at 10). As a result, she was unable to compare the known, original JPEG/JPG image to the images in the final PowerPoint slide using hash values. (*Id.*).

With the above foundation, Ms. Lisiewski reviewed the images submitted with the application for Grant 5. (*Id.* at 3, 10). She observed that, like the images in the final PowerPoint slide above, the images submitted with the grant application “could not be extracted because they had also been merged prior to embedding” in a PDF format, and “[t]herefore, they could not be exported or hashed for comparison.” (*See id.* at 10). Additionally, she reviewed what appeared to be the “raw” and “white box” images associated with the grant application and an intermediate PowerPoint, although the apparent “raw” and “white box” images were not included as separate

files within the intermediate PowerPoint file or the submitted grant application. (*Id.* at 3, 6). However, because the PDF images in the grant application had been merged, she could not determine whether they derived from the apparently related “raw” and “white box” images by comparing hash values. (*Id.* at 10).

Ms. Lisiewski’s testimony is relevant to the jury’s credibility-and-weight determination of Dr. Brookes’s testimony regarding his processes of comparison. As noted above, Dr. Brookes intends to opine that he used “standard forensic analytical methods” to compare images that Dr. Wang submitted in grant applications with what he believed were the associated “raw” and “white box” images and found what he believed to be fabrication. (*See* Ex. 5). Ms. Lisiewski’s testimony goes to the weight and credibility of this testimony because it shows (1) that Dr. Brookes’s analysis cannot be corroborated using hash value comparison—a common and fundamental practice in digital forensics for image comparison; and (2) Dr. Brookes’s opinion of fabrication is premised on his belief that he compared the submitted images with the true “raw” image—a belief that cannot be forensically verified. As a result, Ms. Lisiewski’s testimony that Dr. Brookes’s conclusions cannot be verified and tested through alternative, validated digital forensic tools is relevant and, indeed, is critical to Dr. Wang’s defense.

c. The probative value of Ms. Lisiewski’s testimony is not substantially outweighed by a danger of confusing the issues.

The Government’s challenge that Ms. Lisiewski’s testimony will confuse the issues misunderstands the relevance of her testimony. (*See* Doc. 85 at 11). The Government is seeking to convict and imprison Dr. Wang for submitting allegedly false Western blot images to the NIH in grant funding applications. (Doc. 1). It appears that the Government intends to primarily rely upon Dr. Brookes’s testimony regarding his comparisons of the submitted images with purported “raw” and “white box” images at trial, in which he repeatedly recognizes that his opinions assume that he

has the correct original images. (*See, e.g.*, Ex. 5 at 5 (“In the absence of original blot images showing the bands of interest as they appear in the final figure, it is my professional opinion that the final figure and its parent white box image and band pattern have been fabricated.”)). As a result, whether Dr. Brookes’ testimony is reliable and credible, including whether Dr. Brookes has evaluated the correct original images, is an integral issue for the jury to decide, and the probative value of Ms. Lisiewski’s testimony is high. Additionally, any danger that the issues will be confused is not unfair, nor is it so substantial, that it outweighs the proffered testimony’s probative value. *Mohr*, 318 F.3d at 620.

3. For these reasons, the Court should deny the Government’s motion to exclude unless it grants Dr. Wang’s motion to exclude Dr. Brookes, in which case Dr. Wang will not need to call his experts.

The Government’s allegations accusing Dr. Wang of committing serious criminal violations involve highly technical and scientific evidence. Not only must a jury of laypersons understand the process of Western blot imaging, it must also understand digital forensic analysis. The Government intends for Dr. Brookes to testify—based only on his review of images—that Dr. Wang submitted fabricated and falsified data to the NIH. In light of such technical and scientific foundations, if Dr. Brookes is permitted to testify, but Dr. Wang is denied the opportunity to challenge the credibility of Dr. Brookes’s testimony through his own experts, it will cause a denial of Dr. Wang’s constitutional right to challenge the Government’s evidence against him in an adversarial process. Thus, if this Court denies Dr. Wang’s motion in limine to exclude Dr. Brookes’s testimony, it should likewise deny the Government’s motion to exclude Dr. Wang’s experts.³

³ Dr. Wang no longer intends to call Peter Radtke as a witness, so the portion of the Government’s motion concerning his testimony should be denied as moot.

Dated: September 5, 2025

Respectfully submitted,

/s/ Jennifer L. Beidel

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CERTIFICATE OF SERVICE

I hereby certify that on the 5th day of September, 2025, I filed the foregoing RESPONSE TO THE GOVERNMENT’S MOTION TO EXCLUDE DR. WANG’S EXPERTS FROM TESTIFYING AT TRIAL using the Court’s CM/ECF system. The CM/ECF system sent a “Notice of Electronic Filing” to all counsel of record who have entered an appearance in this matter.

Dated: September 5, 2025

/s/ Jennifer L. Beidel
Jennifer L. Beidel (Pro Hac Vice)